

JPRS: 4464

17 March 1961

SURVEY OF SOVIET HEAVY INDUSTRY (10)

19991222 053

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JPRS: 4464

CSO: 1300-S/10

## SURVEY OF SOVIET HEAVY INDUSTRY (10)

This is a series report, published approximately biweekly, which contains items of interest on Soviet heavy industry as reflected in articles, short news items, announcements, etc., appearing in various USSR and other publications. The items contained in this report fall under the broad categories listed below in the table of contents.

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## MACHINE TOOLS

### Semi-Automatic Lathes

A group of designers from the Krasnyy Proletariy Plant, headed by Comrade Gribryukov, completed the designing of seven new models based on the mass production machine tool, the 1K62. These include multi-cutter semi-automatic lathes, designed for machining small body parts, gears, flanges, and bearing rings. They all work on an automatic cycle. The mechanisms are activated with the aid of hydraulic devices. These models differ from the 1K62 machine tool in several new components. Mass production of these new tools will begin in 1961. (Vechernaya Moskva, 29 August 1960. Full translation).

### Automatic Honing Tool

An original honing tool, model OF-42, was created by a group of designers of the Odessa Plant imeni S. M. Kirov, headed by chief designer A. Krasnyanskiy. The tool is dual-columned. Each column is an independent honing unit and can operate independent from the other. On the left column the rough honing is done and on the right--the finishing. The unification of two machine tools into one considerably improves and simplifies the transfer of a blank from one operation to another.

An outstanding peculiarity of the new model is the fact that the rough machining process is controlled by an active control mechanism.

The tool is equipped with a magnetic separator which cleans the liquid coolant of the smallest particles of abrasives and metal. The OF-42 automatic machine tool sharply increases labor productivity. One worker can operate a group of these machine tools. The operation of each ten tools will save the state 160,000 rubles per year. (Ekonomicheskaya Gazeta, 28 August 1960. Full translation).

New Universal Tooth-Grinding Tool

At the Moscow Grinding Tool Plant, a new type universal tooth-grinding semi-automatic machine tool, model 586, has been developed. The tool grinds gear teeth on a fully automatic cycle. (Ekonomicheskaya Gazeta, 12 August 1960. Partial translation).

New Coordinate-Cutting Tool

The collective of the Moscow Coordinate-Cutting Machine Tool Plant built the Soviet Union's first coordinate-cutting machine tool with program control. The new tool has an accuracy of up to 4 microns. It is designed for the tool industry. The first of these tools has successfully passed factory tests. (Yerevan, Kommunist, 29 July 1960. Full translation).

### New Programmed Tools

New make machine tools with program control will be produced during the third year of the Seven-Year Plan by the machine builders of the Leningrad Plant imeni Sverdlov. Production will be increased ten-fold by 1965.

The Leningrad machine tool builders began to construct equipment working on a given program three years ago. The plant's first model, a coordinate-cutting tool, made everyone enthusiastic. It was awarded the grand prize at the Brussels exhibit. But its younger brothers have gone far ahead, both those which are now being produced in series and those which will be produced in 1961. The "series 262-PR-1" can cut not twelve apertures at once as the test model, but 48. It works not on one, but on four programs at once.

Now the enterprise collective has taken one more step forward. The first tools were programmed only in the matter of setting up coordinates. Experimental work is now being conducted in the plant laboratory for the creation of an entirely machine tool, the 262-PR-2. The

### New Programmed Tools (cont'd)

plant's chief engineer, I. I. Verin, tells us of this marvelous new tool: "the problem of programming not only for setting up coordinates but for changing the tool has been solved for the first time. Our 262-PR-2 is equipped with a mechanical hand, which will insert and remove the tool as well as put it in the proper place. This is the first tool of its type in the world. The development of these tools will be a great step forward in the age of complete automatic operation. (Izvestiya, 18 December 1960. Full translation).

### New Horizontal-Drilling Tools

Three giants -- three new, powerful horizontal-drilling tools of an aggregate type with program control -- will be delivered in August to the Moscow Kompressor Plant. These highly productive mechanisms were built by the collective of the Moscow Machine Tool Plant imeni Ordzhonikidze.

The program of operations is given by a command mechanism. Its commands are carried out by a special electronic unit, based on the application of diodes. Machining a blank, the horizontal-drilling tool can make more than 1000 apertures of the necessary diameter in sequence.

Yesterday tests on two of the aggregates began at the machine tool plant. The third tool is being mounted. (Moskovskaya Pravda, 29 July 1960. Full translation).

### Semi-Automatic Drill Line

The decisions of the July Plenum of the Central Committee of the CPSU were unanimously approved by the collective of the Vil'nyus Drill Plant. Much has been done at the plant, but great tasks face the collective in the current Seven-year Plan. Right now much is being done at the plant for the automation production processes. In the first shop a semi-automatic drill sharpening line has been set up. The Vitebsk Machine Tool builders have lent great help to their Lithuanian friends. The Vitebsk enterprises long ago established close, friendly contacts with our republic. In particular, the collective of the Vitebsk Plant has maintained contact for many years with the machine tool builders of "Zhal'giris". These friends meet often and share their experience. The Byelorussians now have new friends in Vil'nyus -- the workers of the drill plant.

The entire semi-automatic drill sharpening line was produced by Vitebsk machine tools. Much labor was expended in assembling and adjusting the new equipment

Semi-Automatic Drill Line (cont'd)

by the brigadier of the repair brigade, S. Yudenis, shift foreman S. Kavalvauskas, adjustor B. Malinavichyus and many other specialists. The first half of the line is already in operation, and the second will soon follow suit. (Sovetskaya Litva, 25 August 1960. Partial translation).

New Machine Tools

Since the beginning of the year the Tyazhstankogidropress Plant in Novosibirsk has started producing 10 new types of machinery. These include such unique machines as a planing-grinding tool with a working area on the table of 4-12 meters, an automatic press for producing pipes from non-ferrous alloys, and a 2900 ton press for applying lead coating to cables, etc.

The plant workers have obligated themselves to celebrate the 43rd anniversary of the Great October Revolution with new achievements in technological progress. It is planned to produce a unique machine tool for machining heavy blanks very soon. This machine will weigh 400 tons and will be a great contribution on the part of the Novosibirsk engineers and workers towards the development of heavy machinery construction. The heavy, unique horizontal-cutting tool with program control will be called the machine of the future. The assembly and adjustment is now being completed.

Accepting the obligations, our collective has counted on the friendly aid of the workers of the Khar'kov

New Machine Tools (cont'd)

Economic Region, who are supposed to produce the control units and the direct current motors for our above-plan machine tools. Such aid, in our opinion, would not be too much for the collectives of the Khar'kov Electro-Mechanical and Electro-Apparatus Plants, as well as the Elektrostanok Plant. But so far we have received nothing but negative replies from them. The men of Novosibirsk are not losing hope that they will receive support and aid from the men of Khar'kov. (Pravda, 17 October 1960. Partial translation).

Machine Tool Plant Expansion

The collective of the Vitebsk Groove-Cutting Tool Plant has scored a great production victory. A new production building with an area of 2.8 thousand square meters has been constructed and put into operation.

New highly productive equipment has been set up in the well lighted and spacious shops. On the first floor, where universal-groove cutting tools are assembled, the adjustment of a self-propelled conveyor is being completed, which will aid in increasing machine tool production by more than 150%. (Ekonomicheskaya Gazeta, 3 August 1960. Full translation).

Machine Tool Plant Reconstruction

The Leningrad Plant imeni Il'ich and the Automatic Machine Tool Plant right now produce grinding and lathe equipment. In a few years their technological profile will be unrecognizable. Machine tools will be produced here in large quantities, which will be able to machine blanks with an accuracy of 6 times greater than present levels.

In the Leningrad Department of the National Institute on Designing Machine Tool. Casting and Abrasives Plants, "Giprostanok", the plan is being formulated for reconstructing these two plants. Here will be created one of the country's largest centers of precision machinery construction.

The machining accuracy on the automatic longitudinal cutting and grinding tools which will be produced after the retooling of the enterprises, will be from 1-2 microns. In order to achieve such a high accuracy it is necessary to eliminate vibration. For this purpose the shop buildings will be constructed as one-

Machine Tool Plant Reconstruction (cont'd)

story buildings, with insulated foundations. (Lenin-gradskaya Pravda, 6 August 1960. Full translation).

Copying-Planing Machine

The Gomel' Machine Tool Plant imeni Kirov has produced the first Soviet copying-planing machine with a tracer system and programmed operation for machining turbine blades. It was shipped to the Leningrad Metal Plant. The Gomel' Plant will produce 10 more of these machine tools for the Leningrad Metal Plant, Leningrad Nevskiy Plant, and Khar'kov Turbine Plant. (Minsk, Sovetskaya Belorussiya, 24 August 1960).

Unit-Type Machine Tools

The Khar'kov Unit-Type Machine Tools Plan has already produced 182 unit-type machine tools. (Moscow, Ekonomicheskaya Gazeta, 13 August 1960).

Uzbek Machine Tool Production

In 1957, 127 metal-cutting machine tools were produced in the Uzbek SSR; in 1958, 205 units; and in 1959, 428 units. (Moscow, Yezhegodnik Bol'shoy Sovetskoy Entsiklopedii, 1960, page 167)

Roller-Machining Line

The Moscow Krasnyy Proletariy Plant has finished designing a new MKL-2 automatic line for machining rollers. It has a productivity of 140,000 rollers per year. The entire operation is automatic and the machined rollers are packed mechanically into special boxes. (Moscow, Komsomol'skaya Pravda, 21 August 1960).

## CHEMICAL INDUSTRY

### Polyethylene Film

The machine constructors of Kiev will produce 15 models of machines, aggregates and operational units for the heavy chemical industry this year. The Bolshevik Plant, at the request of the Okhtenskiy Chemical Combine, has already produced machinery for manufacturing polyethylene film with a width of 1½ meters. The Novotagil'sk Plastics Plant, "Bolshevik", will receive a continuous operation machine for producing phenoplastics. Chemical enterprises will also receive equipment from the "Leninskaya Kuznitsa". (Pravda Ukrayny, 15 September 1960. Full translation).

## SELF-PROPELLED MACHINERY

### Subterranean Power Shovel

The designers of the Kovrovsk Excavator Plant have developed a new model small size machine for working underground. The subterranean power shovel, the E-1575, is equipped with caterpiller treads. It is designed for loading ore which has been broken up by dynamite. The 90 degree turning cycle for the boom is 15 seconds. The shovel has a scoop with a capacity of 0.75 cubic meters as well as removable equipment -- direct and inverted shovels.

The new excavating machine exhibited good technological and operational qualities during tests at the Dzhezkazgan Combine. The excavator Plant will furnish the mining industry with about 10 of these machines by the end of the year. (Sovetskaya Rossiya, 15 September 1960. Full translation).

## METALLURGY

### Steel-Pouring Ladles

Last year at the Orsk Heavy Machine Construction Plant, production began on all-welded steel-pouring ladles. A 90 ton. capacity ladle was produced for their own open-hearth furnace. At present this aggregate is considered a "little squirt". The Magnitogorsk Metallurgical Combine just received three 300 ton capacity ladles.

All-welded steel-pouring ladles of large capacity are new innovations in Soviet machine construction. They are not only powerful, but only half as heavy as riveted ladles. Production costs have also decreased. (Komsomol'skaya Pravda, 17 September 1960. Partial translation).

### The 4200 Heavy Sheet Mill

The 4200 heavy gauge rolling mill extends for almost 2 kilometers. About 1500 electric motors operate the hundreds of machines and mechanisms. A unit of sheet steel will come off the gigantic conveyor every 45 seconds. In the mills' operating areas, multi-ton blanks will be transformed into 4 meter wide steel ribbons with a thickness of up to 60 millimeters. The rolling cycle has been mechanized and made automatic.

This mighty project was developed ahead of schedule by the designers of the Novo-Kramatorsk Plant. (Pravda Ukrayiny, 16 September 1960. Full translation).

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## PUMPS AND COMPRESSORS

### New Pump

The Road Machinery Plant in Kurgan has completed the assembly of a unique pump with a capacity of 3000 liters per hour. It is designed for bitumen transfer. Zaural'ye products will be sent not only to the plants and construction projects of our own country, but to 26 other countries. (Leningradskaya Pravda, 28 September 1960. Full translation).

### Gas Force-Pump

The East's largest turbo-mechanism plant, the Khabarovsk Energomash Plant, began to produce for the October quota on 27 September. The mechanical processing and assembly lines received the first parts of the new machinery -- a gas force-pump for gas pipes and an electro-ventilator for the ocean-going tanker Bud-apesht, which is being assembled in Leningrad. (Leningradskaya Pravda, 28 September 1960. Full translation).

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## LOADING AND HOISTING MACHINERY

### Electric Turret Crane

An electric turret crane has been built at the Dneprovsk Mechanical Plant (Zaporozh'ye) which can lift a 75 ton load to a height of 80 meters and, with the aid of its boom, transfer it within a radius of 52 meters. (Pravda Ukrainskay, 17 September 1960. Full translation).

## MISCELLANEOUS

### Bolt and Nut Production

The Yerevan Stankonormal' Plant of the Armenian Sovnarkhoz is still under construction, but it is already manufacturing products. It supplies Armenian machine building and electrical engineering plants with bolts, nuts, pins, collars, washers, and other products. (Yerevan, Kommunist, 19 August 1960).

Industrial Development in the Uzbek Republic

During the last year and a half the economy of Uzbekistan has achieved great success. The national plan for 1959 and that for the first 8 months of the current year have been fulfilled. More than 1.8 billion rubles of above plan production has been achieved during this period.

Scientific-research organizations and design bureaus have developed during this time the technical documentation for 66 new types of equipment and have created industrial models of 50 types of machinery, 19 of which are already in production. The enterprises of the republic have installed more than 10,000 units of new equipment, have modernized more than 3,000 machine tools and other machinery, and have put 150 conveyor and assembly lines into operation.

However, we still have many shortcomings to overcome in the introduction of new technology. This was correctly indicated by the July Plenum of the Central Committee of the CPSU. Last year the plan for introducing new technology for this republic was fulfilled only

Industrial Development in the Uzbek Republic (cont'd)

at a rate of 59 percent, and for 6 months of this year -- at a rate of 69 percent.

Many instances of this have been caused by poor organization of material-technical supply. Other shortcomings are not so evident. In those enterprises where the management realistically attempted to fulfill the decisions of the Twenty-First Party Congress, the lack of such equipment and materials did not hinder the fulfillment of planned measures for new technology.

Let us take, for example, the Fergana Petroleum Combine. This combine lacked equipment for introducing distance operation of deep-pump wells. The men of the petroleum industry produced a large quantity of the necessary mechanisms and instruments with their own resources and achieved tele-mechanization of all operating wells within a short time.

Consequently, the trouble is caused not so much in supply as in the hard-headedness of some managers. For example, how else is it possible to explain the poor use of welding at our enterprises? At the Tashkent "Pod"yem

Industrial Development in the Uzbek Republic (cont'd)

nik" Plant, where comrade Cherepanov is the chief engineer, only 10 percent of the welding operations are mechanized, and at the Andizhan Irrigation Machinery Plant (Chief engineer, Comrade Tsoy) -- only about 7.5 percent. Both of these plants have all the potentials for mechanizing welding on a comparatively large scale.

At the "Chirchiksel'mash" Plant the manufacture of cultivator blades of wear-resistant alloys has not been organized. This would increase their life 2 - 2.5 times. This method, which saves much metal, was tested successfully at the plant in 1958. But in spite of the positive results of the test and the active aid of the scientists, the plant managers, Comrades Shevchenko and Sopitalev, have not incorporated the application of this new technology.

This is the second year that the Tashkentkabel' Plant has not fulfilled its task in the complex mechanization of rubber mixture transport, preparation and feeding into the aggregates. The director and chief engineer of the plant, Comrades Safonov and Kostygov, have not even acquired the necessary technical documenta-

Industrial Development in the Uzbek Republic (cont'd)

tion for carrying out this measure.

The automation of production processes is often delayed due to the poor quality of plan documentation and the slow rate of compilation. The Neftekhimavtoma-tika Scientific-Research design Institute, in fulfilling the plan for designing the automation of technological processes at the Andizhan Hydrolysis Plant, passed on serious defects, the elimination of which took a large amount of time. The automation plan for the Chirchik Electro-chemistry Combine was also of poor quality. (Ekonomicheskaya Gazeta, 22 September 1960. Partial translation).

Machinery Improvement

Many machines of domestic manufacture, as is well known, are superior to the best models produced in capitalist countries. But they nevertheless contain substantial shortcomings. We mean reliability, economical operation, and long operational life. For example, it is well known that 30 percent of all tractors in the country are out of commission every year due to technical defects. Only 60 of every 100 trucks are in operation. This means that the means of transport are stagnating in the national economy. The number of vehicles out of commission exceeds the annual production of all motor vehicle and tractor plants combined.

Tremendous funds are being expended on servicing and repairing machinery. More than 6,000,000,000 rubles are spent each year on tractor repairs. So much is spent on spare parts that it would be possible to use these parts to assemble 180,000 new tractors. Of the metal expended each year on repairing metal-cutting equipment, it would be possible to produce 150,000 medium

Machinery Improvement (cont'd)

capacity lathes.

The sum to be spent on the production of spare parts for motor vehicles during the Seven-year Plan is double that of the value of all existing trucks. So much metal will be expended that it could be used for producing 3,000,000 motor vehicles.

Large expenditures have been approved for equipment repair. It is a common occurrence to have the cost of repairing one machine exceed the price of a new one. For example, the Ul'yanovsk Plant produces motors costing 650 rubles. If a motor will operate for five years, or 8,000 hours, repairs will cost 6400 rubles, predominantly for spare parts. The result is that 8,000 hours are not worked by one motor, but by 8, of which 7 consist of spare parts. Five times the cost of production is spent on repairing compressors which are produced in Kazan'.

The whole matter boils down to the fact that up to now not enough consideration has been given in planning

Machinery Improvement (cont'd)

and producing machinery to its operational life and economical use. As a rule, each new piece of machinery is tested within the limits of the guarantee, which, in the majority of cases, is extremely short. During such tests only rapidly wearing parts can be revealed, a set of which is included as spare parts with the machinery. The same Kazan' Plant produces 55-60 compressors in the form of spare parts for every 1000 compressors produced. Can we allow such extravagance?

The length of service for parts of a compressor produced by the Kazan' Plant was calculated according to the method suggested by the author of this article.

Results showed that the compressor had to be repaired only 5 times during its operational life of 15 years, after each 20,000 hours of operation. The cost of all repairs comprise 95 percent of the cost of compressor production, and one half of all expenditures went for replacement and repair of parts. Based on existing norms, it should have had 7 major repairs, 7 average

Machinery Improvement (cont'd)

repairs and 226 minor repairs, the cost of which would be 5 times greater than the cost of producing the machinery. At the same time, the requirements for spare parts decreased by 5 times. Six to 8 million rubles can be saved on each 1000 new compressors.

Obviously these results are convincing enough. Considering the extreme importance of this problem, the Tatar Economic Council required the managers of enterprises and chiefs of design bureaus to create laboratories and groups for determining economy, long operational life and reliability of machinery.

Reliability sections are being set up on the technical councils of the enterprises. These sections are supposed to coordinate the work of the laboratories and groups with the various departments and control-testing stations. In the course of 1960-1961 basic items are supposed to be tested for determining their operational life, reliability and economical operations. Mass production of new machinery can begin only upon the receipt of positive results as to reliability.

Machinery Improvement (cont'd)

Not long ago the problem of reliability and operational service of machinery was discussed at the Technical Council of the Chistopol'skiy Clock Factory. The council decided to extend the guarantee for motor vehicle clocks and wristwatches from 1-2 years. This will save about 7 million rubles.

But the success of the Chistopol'skiy Clock workers will depend to a great extent on the supplier plants. It is necessary to increase the operational life of clock lubricants produced by the Krasnodar Economic Council, wrist watch main springs produced by the Leningrad Steel Rolling and the Belorechenskiy Steel Wire Plant. It is also necessary to increase the durability of the jewel movements produced by the Kusinskiy, Ugiichskiy and Petrodvorets Plants, in order to insure top quality for N41 XTA brand alloy clocks.

Reviewing the production technology of one type of manometer, the workers of the Teplokontrol' Plant increased the reliability and doubled the length of service

Machinery Improvement (cont'd)

of this instrument, a fact which caused a savings of up to 4,000,000 rubles. The enterprise collective is succeeding in being able to extend the guarantee on most instruments in 1951 to at least twice what it was, and for some types -- 3 times and more.

The reliability of operation of these instruments depends primarily on the stability and operational life of the sensitive elements. Therefore, the USSR State Planning Commission should review problems of creating the specialized centralized production of resilient elements, using in their production dispersal-hardening alloys with highly stable qualities. (Ekonomicheskaya Gazeta, 22 September 1960. Partial translation).